

1. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 + 25x^2 - 48x - 45}{12x^2 + 17x + 6}$$

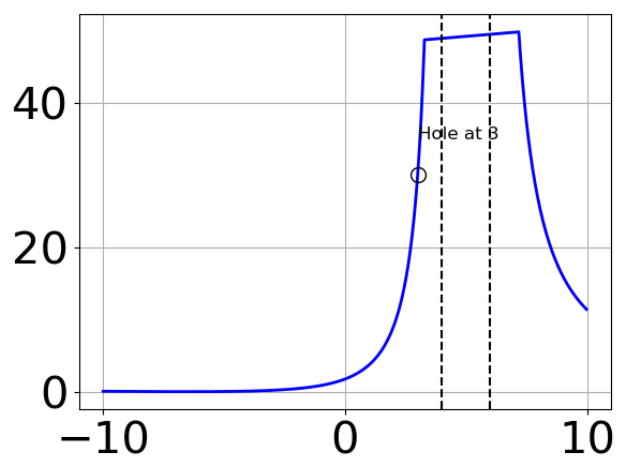
- A. Vertical Asymptote of  $x = -0.667$  and hole at  $x = -0.75$
  - B. Vertical Asymptotes of  $x = -0.667$  and  $x = 1.667$  with a hole at  $x = -0.75$
  - C. Vertical Asymptotes of  $x = -0.667$  and  $x = -0.75$  with no holes.
  - D. Vertical Asymptote of  $x = 1.0$  and hole at  $x = -0.75$
  - E. Holes at  $x = -0.667$  and  $x = -0.75$  with no vertical asymptotes.
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2. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{4x^3 - 16x^2 - 25x + 100}{6x^2 + 11x - 10}$$

- A. Holes at  $x = 0.667$  and  $x = -2.5$  with no vertical asymptotes.
  - B. Vertical Asymptote of  $x = 0.667$  and hole at  $x = -2.5$
  - C. Vertical Asymptotes of  $x = 0.667$  and  $x = -2.5$  with no holes.
  - D. Vertical Asymptote of  $x = 0.667$  and hole at  $x = -2.5$
  - E. Vertical Asymptotes of  $x = 0.667$  and  $x = 2.5$  with a hole at  $x = -2.5$
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3. Which of the following functions *could* be the graph below?

$x=6$ 

- A.  $f(x) = \frac{x^3 - 10.0x^2 + 3.0x + 126.0}{x^3 + 13.0x^2 + 54.0x + 72.0}$
- B.  $f(x) = \frac{x^3 + 10.0x^2 + 3.0x - 126.0}{x^3 - 13.0x^2 + 54.0x - 72.0}$
- C.  $f(x) = \frac{x^3 + 12.0x^2 + 29.0x - 42.0}{x^3 - 13.0x^2 + 54.0x - 72.0}$
- D.  $f(x) = \frac{x^3 - 11.0x^2 + 16.0x + 84.0}{x^3 + 13.0x^2 + 54.0x + 72.0}$
- E. None of the above are possible equations for the graph.
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4. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 + 41x^2 + 40x + 12}{16x^2 - 9}$$

- A. Vertical Asymptote of  $x = 0.75$  and hole at  $x = -0.75$
- B. Vertical Asymptote of  $x = 0.75$  and hole at  $x = -0.75$
- C. Vertical Asymptotes of  $x = 0.75$  and  $x = -0.75$  with no holes.
- D. Vertical Asymptotes of  $x = 0.75$  and  $x = -0.667$  with a hole at  $x = -0.75$
- E. Holes at  $x = 0.75$  and  $x = -0.75$  with no vertical asymptotes.
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5. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{12x^3 - 37x^2 - 3x + 18}{4x^2 + 5x - 6}$$

- A. Horizontal Asymptote of  $y = -2.0$  and Oblique Asymptote of  $y = 3x - 13$
- B. Horizontal Asymptote of  $y = 3.0$  and Oblique Asymptote of  $y = 3x - 13$
- C. Horizontal Asymptote at  $y = -2.0$
- D. Oblique Asymptote of  $y = 3x - 13$ .

E. Horizontal Asymptote of  $y = 3.0$

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6. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{4x^3 - 4x^2 - 23x + 30}{-6x^3 + 8x^2 + 17x - 30}$$

- A. Horizontal Asymptote of  $y = -0.667$
  - B. Vertical Asymptote of  $y = 2$
  - C. Vertical Asymptote of  $y = -1.667$
  - D. Horizontal Asymptote of  $y = 0$
  - E. None of the above
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7. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{6x^3 - 37x^2 + 75x - 50}{12x^2 - 35x + 25}$$

- A. Vertical Asymptotes of  $x = 1.25$  and  $x = 1.667$  with no holes.
  - B. Vertical Asymptote of  $x = 0.5$  and hole at  $x = 1.667$
  - C. Vertical Asymptotes of  $x = 1.25$  and  $x = 2.5$  with a hole at  $x = 1.667$
  - D. Holes at  $x = 1.25$  and  $x = 1.667$  with no vertical asymptotes.
  - E. Vertical Asymptote of  $x = 1.25$  and hole at  $x = 1.667$
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8. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{12x^3 + 59x^2 + 79x + 30}{4x^2 - 7x - 15}$$

- A. Horizontal Asymptote at  $y = 3.0$

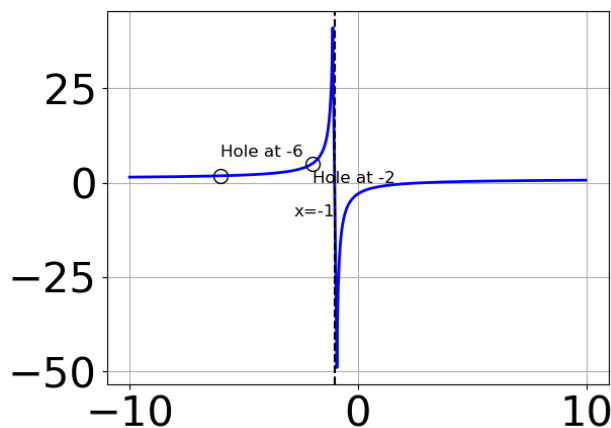
- B. Oblique Asymptote of  $y = 3x + 20$ .
  - C. Horizontal Asymptote of  $y = 3.0$
  - D. Horizontal Asymptote of  $y = 3.0$  and Oblique Asymptote of  $y = 3x + 20$
  - E. Horizontal Asymptote of  $y = 3.0$  and Oblique Asymptote of  $y = 3x + 20$
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9. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{30x^3 - 163x^2 + 187x - 60}{-20x^3 + 34x^2 - 94x + 24}$$

- A. Horizontal Asymptote of  $y = 0$
  - B. Horizontal Asymptote of  $y = -1.500$
  - C. Vertical Asymptote of  $y = 4$
  - D. None of the above
  - E. Vertical Asymptote of  $y = 0.500$
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10. Which of the following functions *could* be the graph below?



A.  $f(x) = \frac{x^3 + 5.0x^2 - 12.0x - 36.0}{x^3 + 9.0x^2 + 20.0x + 12.0}$

B.  $f(x) = \frac{x^3 - 5.0x^2 - 12.0x + 36.0}{x^3 - 9.0x^2 + 20.0x - 12.0}$

C.  $f(x) = \frac{x^3 + 6.0x^2 + 11.0x + 6.0}{x^3 - 9.0x^2 + 20.0x - 12.0}$

D.  $f(x) = \frac{x^3 + 6.0x^2 - 7.0x - 60.0}{x^3 + 9.0x^2 + 20.0x + 12.0}$

E. None of the above are possible equations for the graph.

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